

## CLAIMS

1. A method of heating a motor vehicle cabin by means of a circuit (20) for circulating a cooling fluid for cooling an engine (10) and including a pump (23), an air heater unit (22), and a heat exchanger (21) disposed in an exhaust system (15) that is also provided with a depollution assembly (16), the method being characterized in that the exhaust gas in the exhaust system (15) and downstream from the depollution assembly (16) is directed towards said heat exchanger (21) or towards a bypass duct (18) as a function of engine operating conditions, of the outside temperature, of the heating temperature requested in the cabin, and of the temperature of the engine cooling fluid.
2. A method according to claim 1, characterized in that after the main injection of fuel into the cylinders of the engine (10), and during the expansion stage of the cycle therein, an additional quantity of fuel is injected into at least some of said cylinders in order to give rise to additional combustion of fuel and increase the temperature of the gas flowing along the exhaust system (15) and through the heat exchanger (21).
3. A method according to claim 1 or claim 2, characterized in that the engine operating conditions that are taken into account are the torque and/or the speed of rotation of said engine.
4. A method according to claim 1 or claim 3, characterized in that the exhaust gas is directed towards the heat exchanger (21) without additional injection of fuel for a determined maximum speed of rotation lying in the range 2500 rpm to 3500 rpm, and/or for a torque less than a determined maximum torque lying in the range 100 Nm to 200 Nm.

5. A method according to any one of claims 1, 3, and 4, characterized in that the exhaust gas is directed towards the heat exchanger (21) without any additional injection of fuel while the cooling fluid is at a temperature below  
5 a temperature lying in the range 70°C to 85°C and preferably less than 80°C, and while outside temperature is below a temperature lying in the range 5°C to 15°C, and preferably below 10°C.
- 10 6. A method according to any one of claims 1 to 3, characterized in that the exhaust gas is directed towards the heat exchanger (21) while simultaneously injecting additional fuel for a determined maximum speed of  
15 rotation lying in the range 2500 rpm to 3500 rpm, and/or for a determined torque lying between a maximum torque and a minimum torque, which are functions of the speed of rotation of the engine.
- 20 7. A method according to any one of claims 1, 3, and 6, characterized in that the exhaust gas is directed towards the heat exchanger (21) while simultaneously injecting additional fuel while the cooling fluid has a temperature  
25 lying between a minimum temperature lying in the range -5°C to +5°C and preferably of the order of 0°C and a maximum temperature lying in the range 70°C to 85°C, and preferably of the order of 80°C, and while outside temperature is less than a temperature lying in the range 5°C to 15°C, and preferably of the order of 10°C.
- 30 8. Apparatus for heating a motor vehicle cabin, the apparatus being of the type comprising a circuit (20) for circulating a cooling fluid for cooling an engine (10) and including a pump (23), an air heater unit (22), and a  
35 heat exchanger (21) disposed in an exhaust system (15) provided with a depollution assembly (16), the apparatus being characterized in that the heat exchanger (21) is placed in said exhaust system (15) downstream from the

depollution assembly (16) in the exhaust gas flow direction, and in that it includes a flap (25) for directing the exhaust gas either towards the heat exchanger (21) or towards a bypass duct (18), said flap  
5 (25) being actuated by control means (26) as a function of engine operating conditions, of the outside temperature, of the heating temperature requested in the cabin, and of the temperature of the engine cooling fluid.

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9. Apparatus according to claim 8, characterized in that the engine (10) is a direct injection diesel engine.

10. Apparatus according to claims 8 and 9, characterized  
15 in that the engine (10) includes means for injecting an additional quantity of fuel into at least some of the cylinders of said engine after the main injection of fuel therein, and to do so during the expansion stage of the cycle in said cylinders, so as to give rise to additional  
20 combustion of fuel and increase the temperature of the gas flowing in the exhaust system (15) and through the heat exchanger (21).

11. Apparatus according to any one of claims 8 to 10,  
25 characterized in that the flap (25) can be tilted between a first position for closing the bypass duct (18) and a second position for opening the bypass duct (18), said tilting between said first and second positions taking place in the direction in which the gas flows along the  
30 exhaust system (15).

12. Apparatus according to any one of claims 8 to 11,  
characterized in that the flap (25) is disposed  
downstream from the heat exchanger (21) relative to the  
35 gas flow direction in the exhaust system.